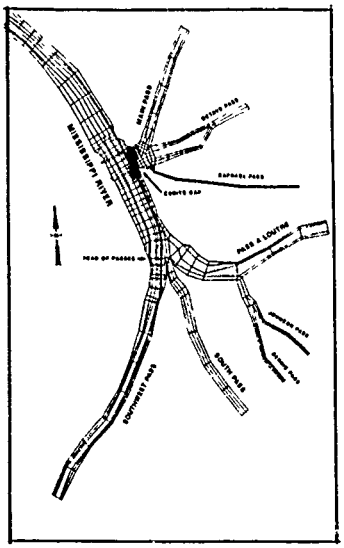
TECHNICAL REPORT HL-90-20

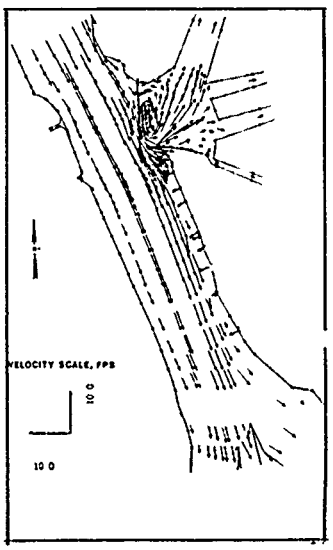
US Army Corps of Engineers

DREDGING ALTERNATIVES STUDY CUBITS GAP, LOWER MISSISSIPPI RIVER

Report 2
TABS-2 NUMERICAL MODEL INVESTIGATION

VOLUME II
APPENDIX B





by

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November 1990
Report 2 of a Series

HYDRAULICS LABORATORY

Prepared for US Army Engineer District, New Orleans
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13. ABSTRACT *(Maximum 200 words)*

This report presents results from the numerical model investigation whose primary objective was to determine the best method to control shoaling in the navigation channel between Cubits Gap and Head of Passes. The secondary objective was to evaluate the best design configuration for a structural dike plan located at Cubits Gap and the ability of these designs to return the flow distribution to its historical levels.

Several plans were proposed by the US Army Engineer District, New Orleans, and local shipping interests to alleviate the recurrence of these shoaling conditions. They included a sediment trap, advance maintenance, and additional training structures. The first two addressed shoaling problems in the reach between Cubits Gap and Head of Passes. The latter addressed shoaling and flow distribution in Cubits Gap. of the Mississippi River in Louisiana. This investigation used the TABS-2 finite element numerical model RMA-2V for hydrodynamic analysis and STUDH for sediment transport computation. A large-flow 87-day hydrograph was used to determine the performance of each plan.

14. SUBJECT TERMS		15. NUMBER OF PAGES
Dike	Sediment trap	Vol I,56;Vol II,26
Hydrodynamic	Sedimentation	16. PRICE CODE
Numerical model		

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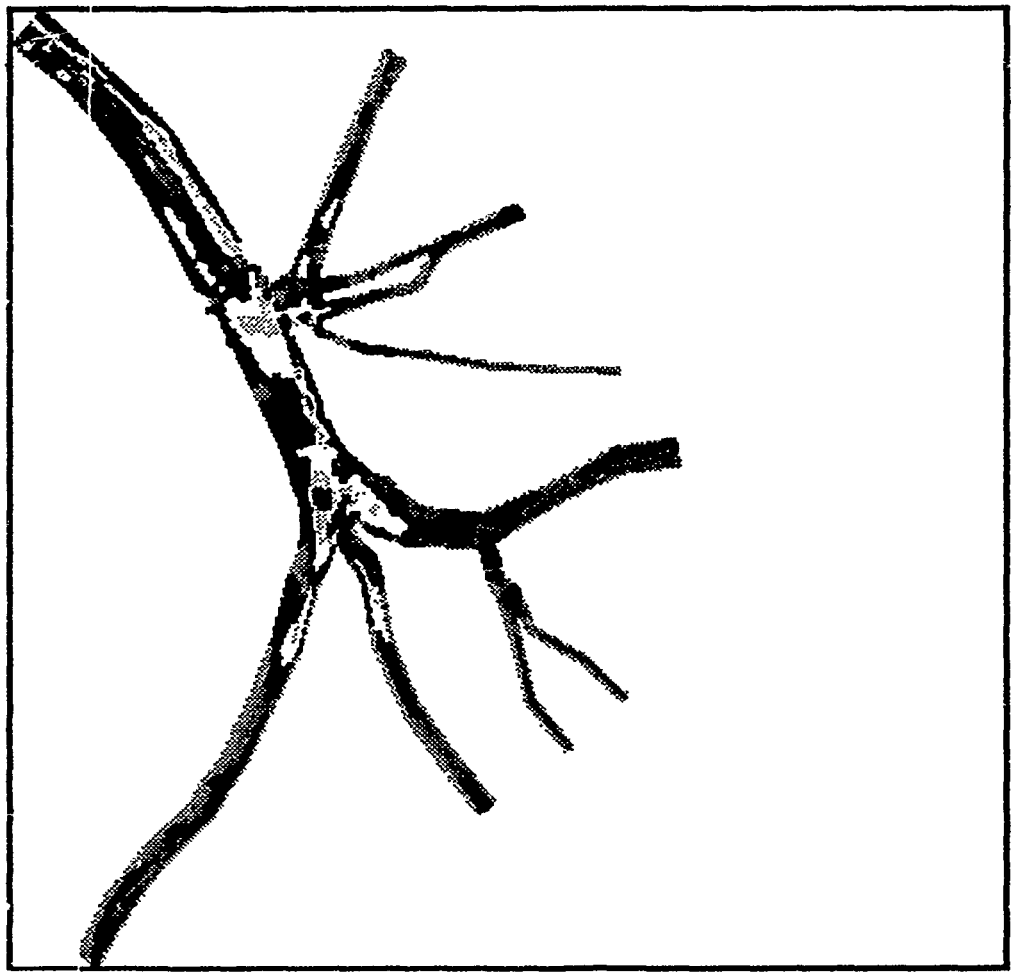
Results from the sedimentation modeling showed that the best nonstructural plan was advance maintenance. It provided a smaller quantity of shoaling than the sediment trap plan and affected a smaller area of the navigation channel. Both nonstructural plans, however, would increase the channel shoaling rate compared to existing conditions. For the structural plan, Plan 1 with a 2,800-ft-long angle dike and 800-ft-long headland dike provided the least amount of shoaling of any plan tested. All three dike plans tested would result in a substantial reduction in channel shoaling. Results from the hydrodynamic modeling showed that dike plan 1 returned the flow distribution at Cubits Gap to the amount expected with the supplement II works in place. This study did not address long-term sedimentation effects within Cubits Gap. If one of the structural plans is selected for implementation, a detailed study in the vicinity of Cubits Gap is recommended to optimize the performance of the structure.

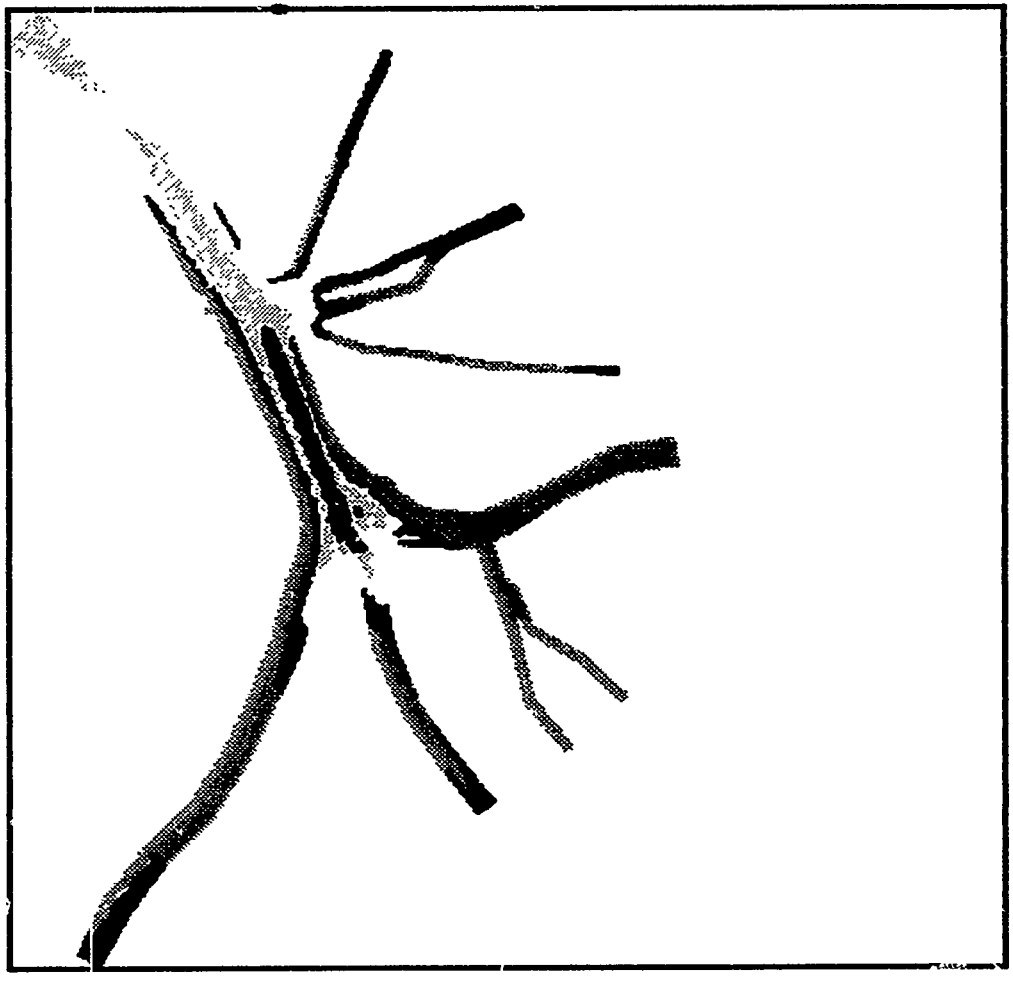
APPENDIX B: PLOTS OF BED CHANGE AND SUSPENDED SEDIMENT CONCENTRATION

*Original contains color plates: All DTIC reproductions will be in black and white.



BED CHANGE
BASE CONDITION
7 FEBRUARY-28 MARCH 1989

PLATE B1



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CONCENTRATION

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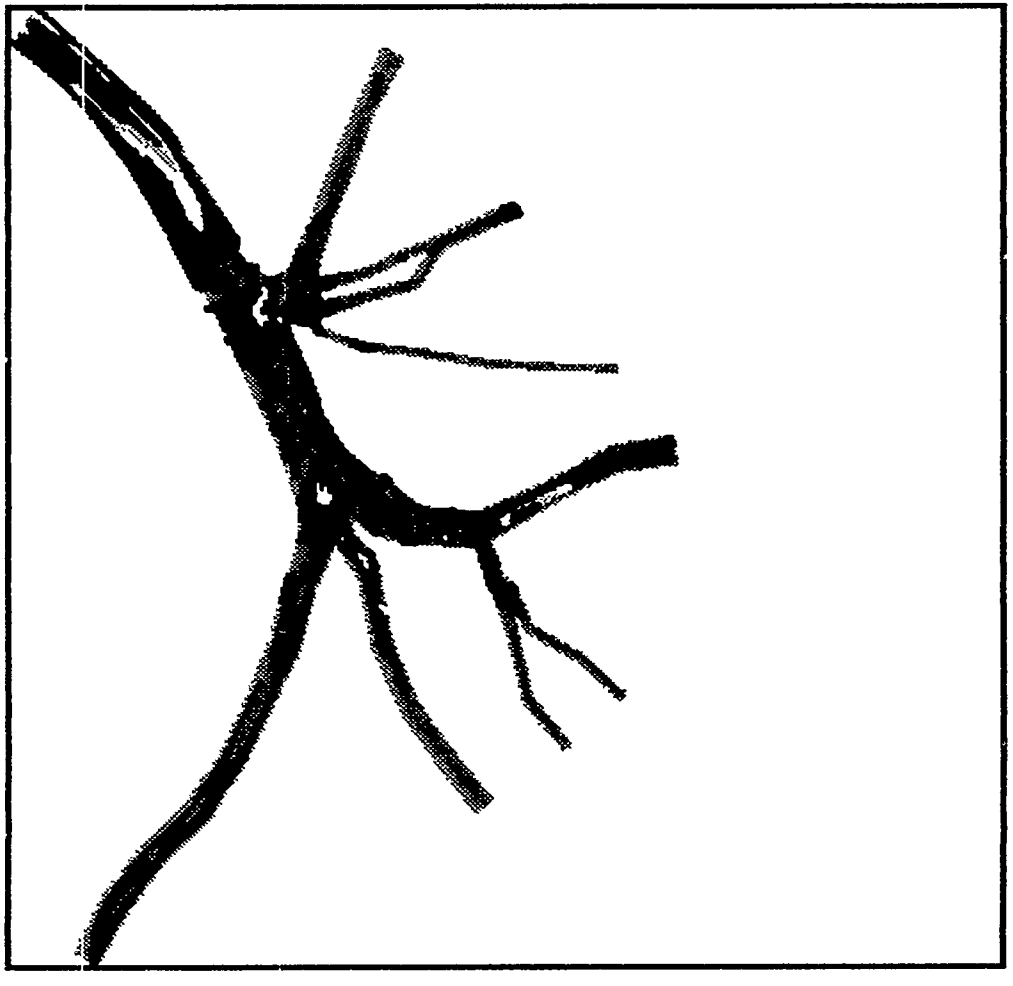
PPM

SEDIMENT CONCENTRATION
BASE CONDITION
7 FEBRUARY-28 MARCH 1989

PLATE B2



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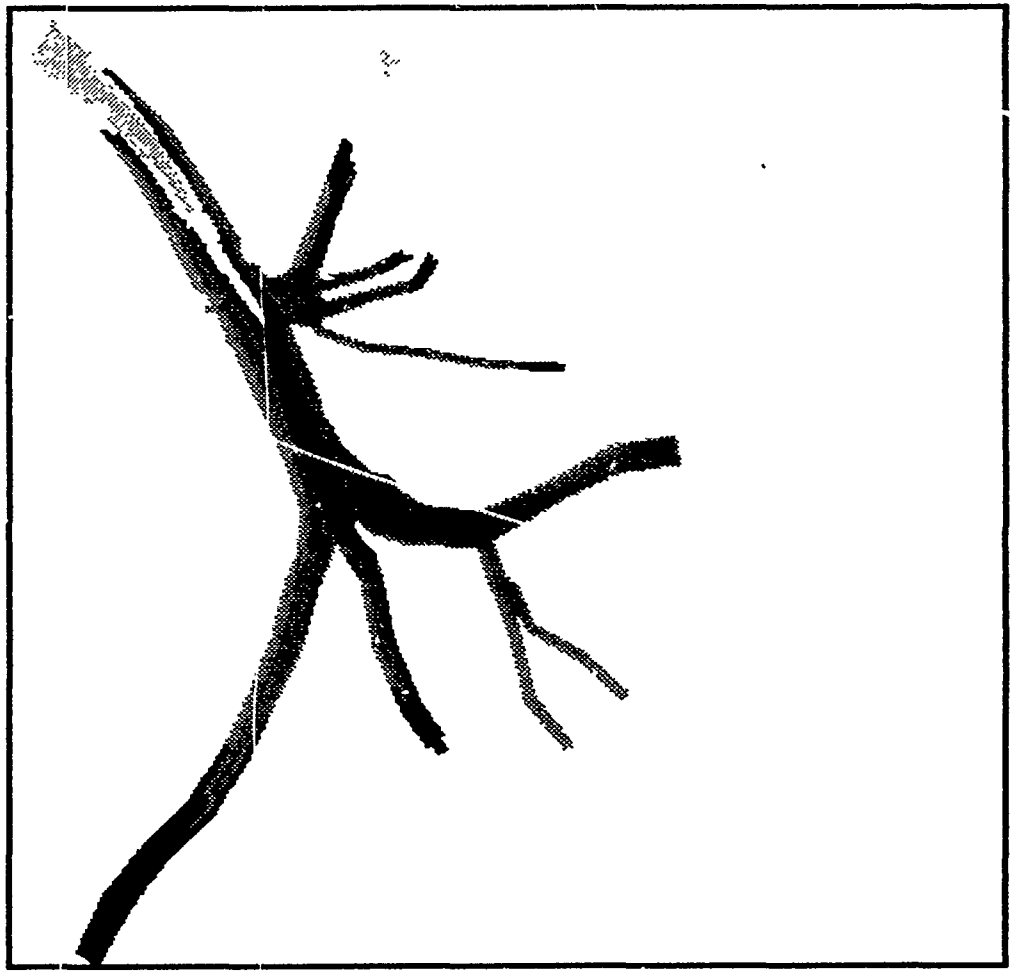
FEET

BED CHANGE
BASE CONDITION
29 MARCH-4 MAY 1989

PLATE B3



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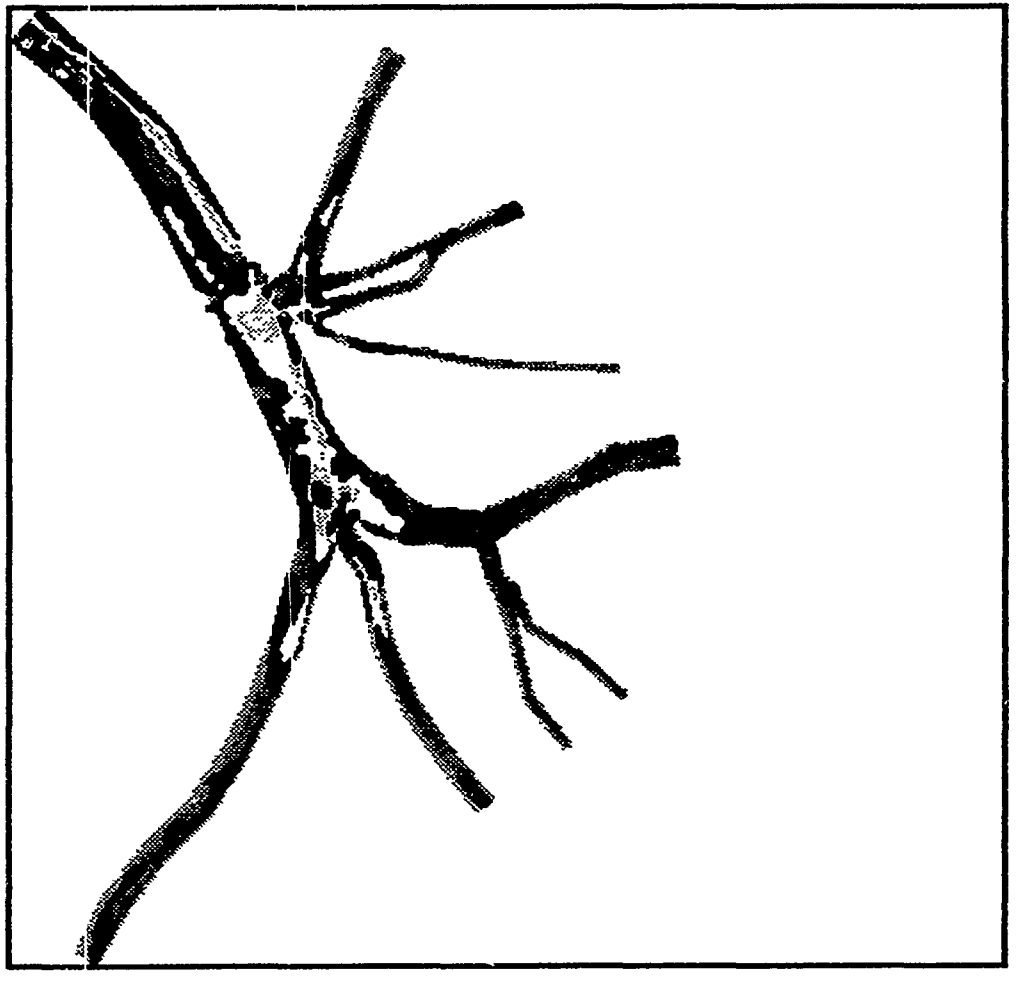
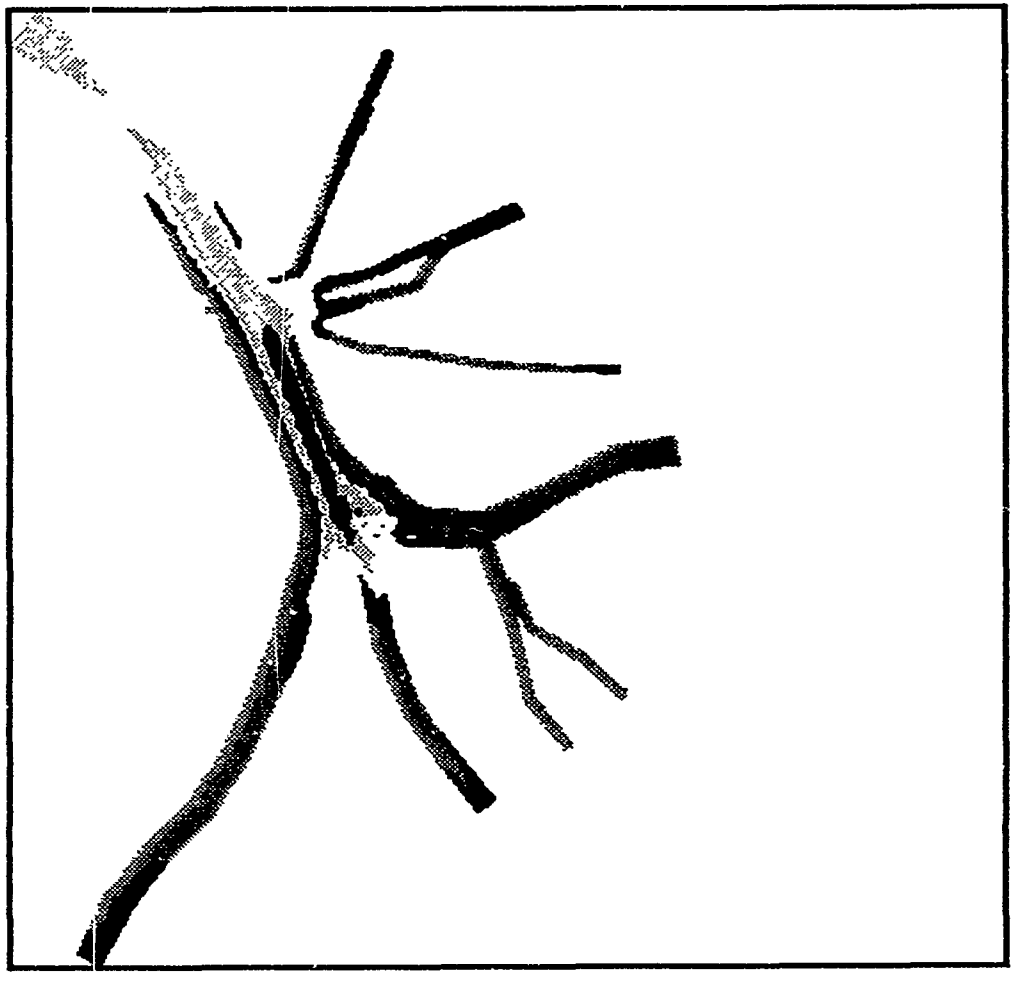
SEDIMENT CONCENTRATION
BASE CONDITION
29 MARCH-4 MAY 1989

PLATE B4



BED CHANGE
ADVANCE MAINTENANCE
7 FEBRUARY-28 MARCH 1989

PLATE B5



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SEDIMENT CONCENTRATION
ADVANCE MAINTENANCE
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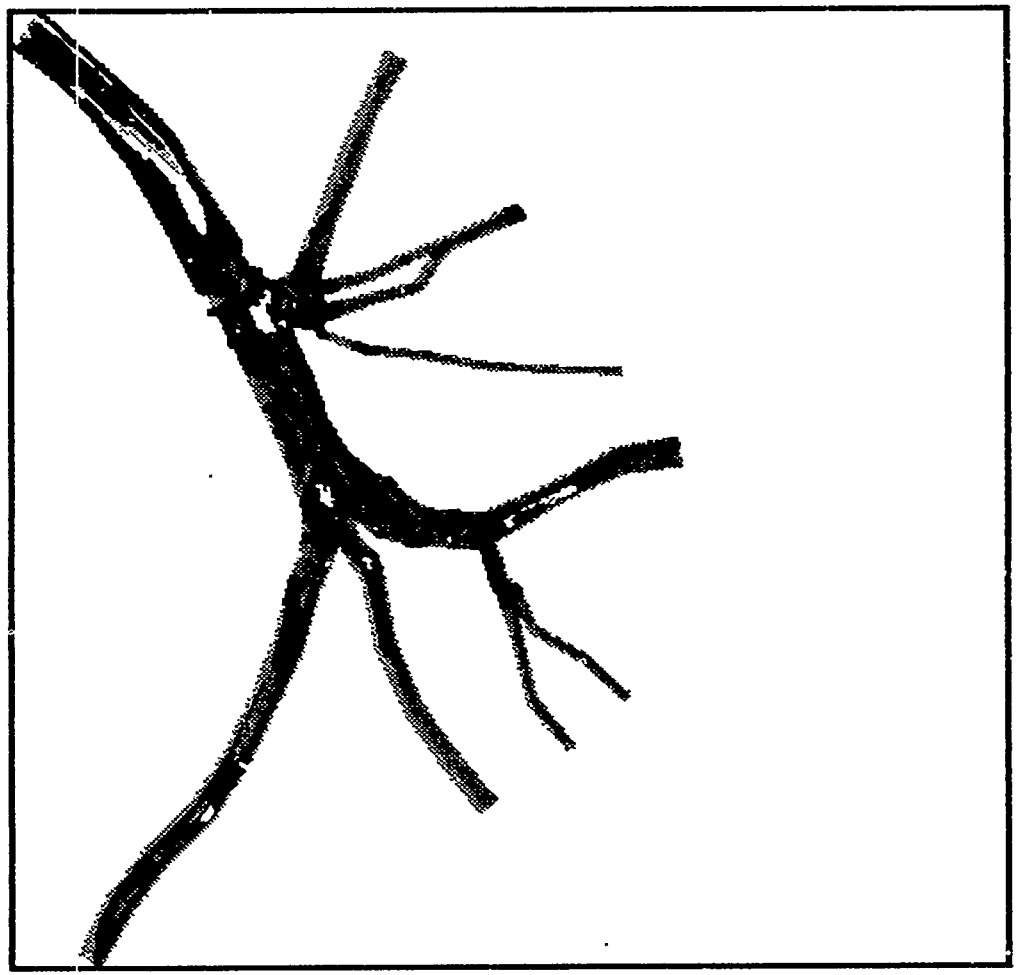

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BED CHANGE
ADVANCE MAINTENANCE
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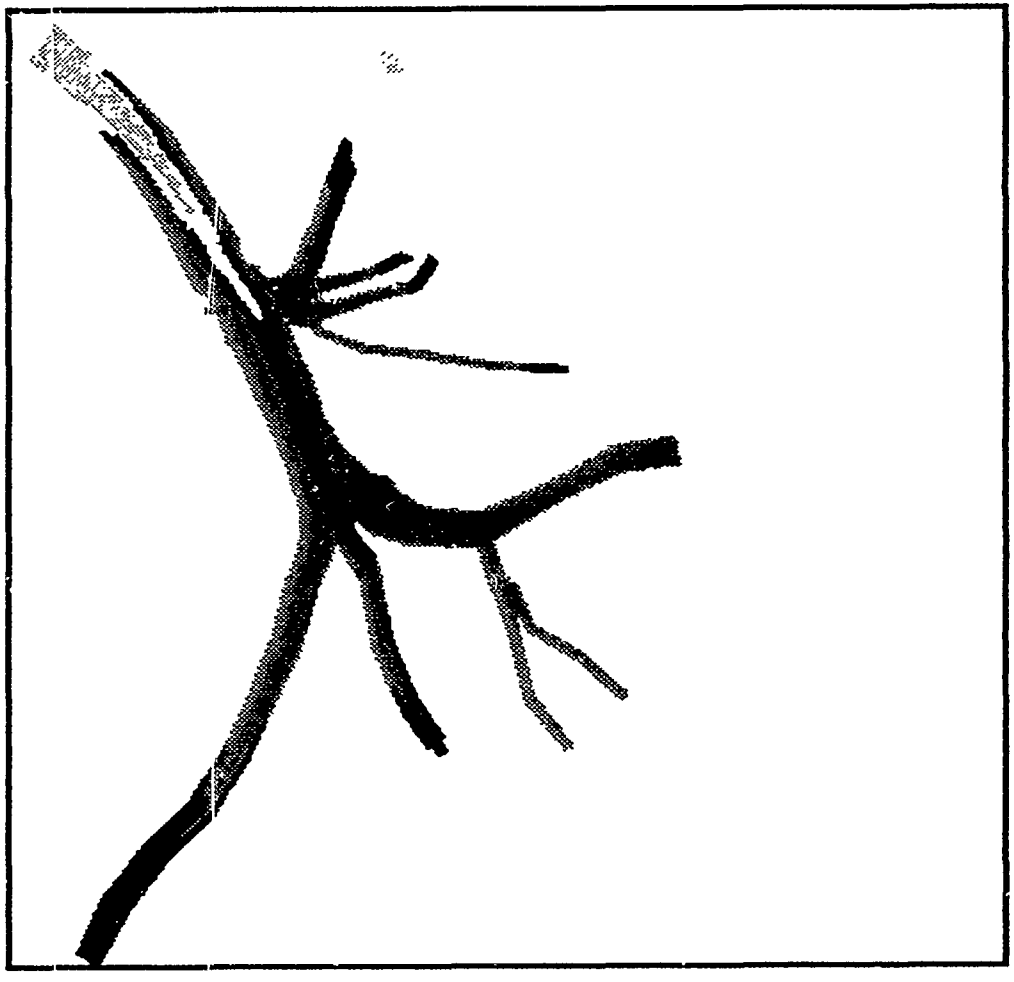
PLATE B7



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SEDIMENT CONCENTRATION
ADVANCE MAINTENANCE
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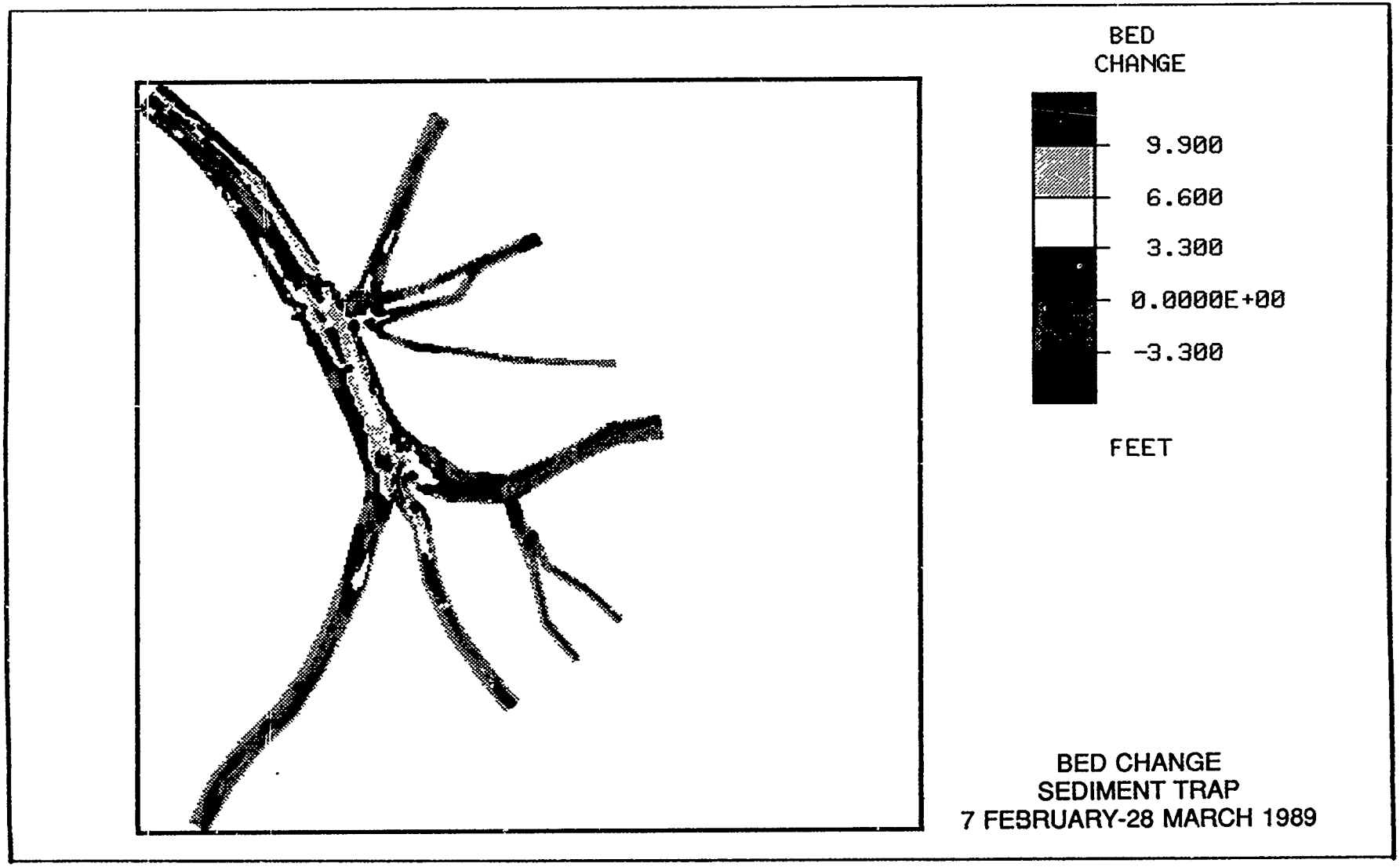
PLATE B8



BED CHANGE
SEDIMENT TRAP
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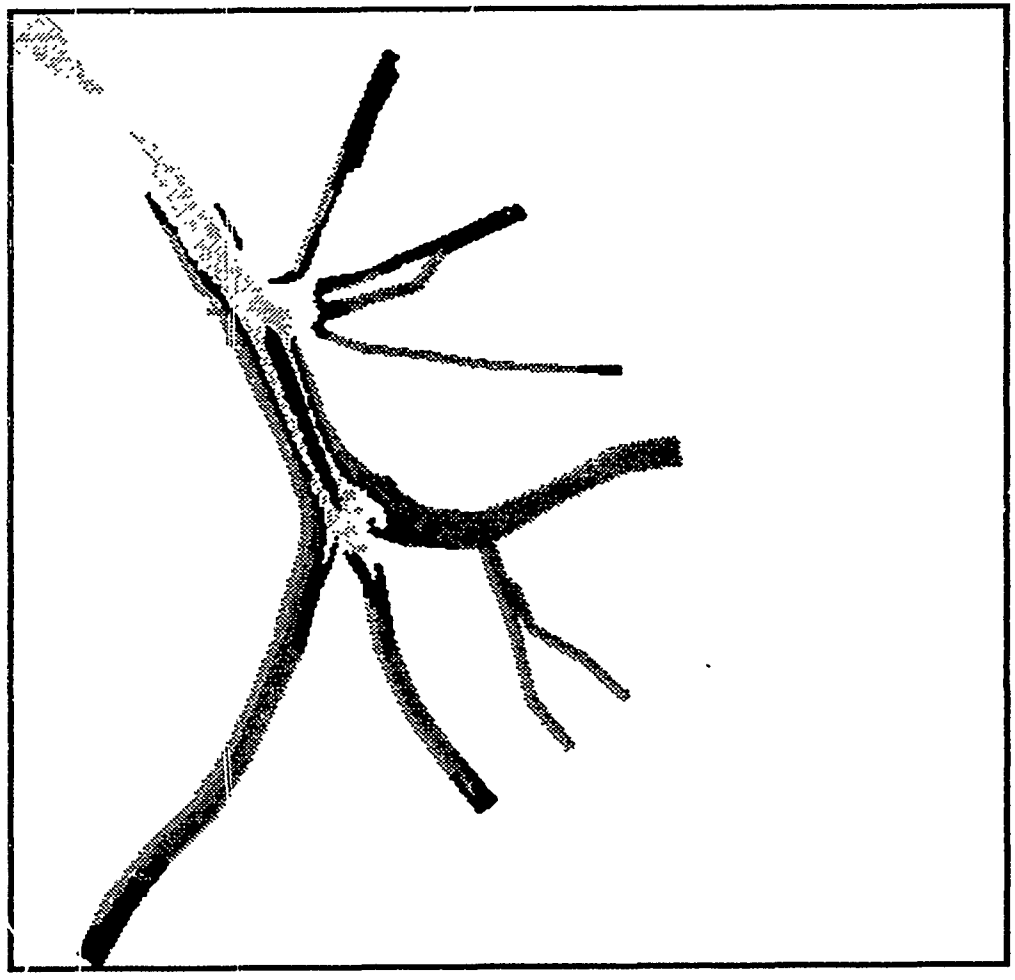
PLATE B9



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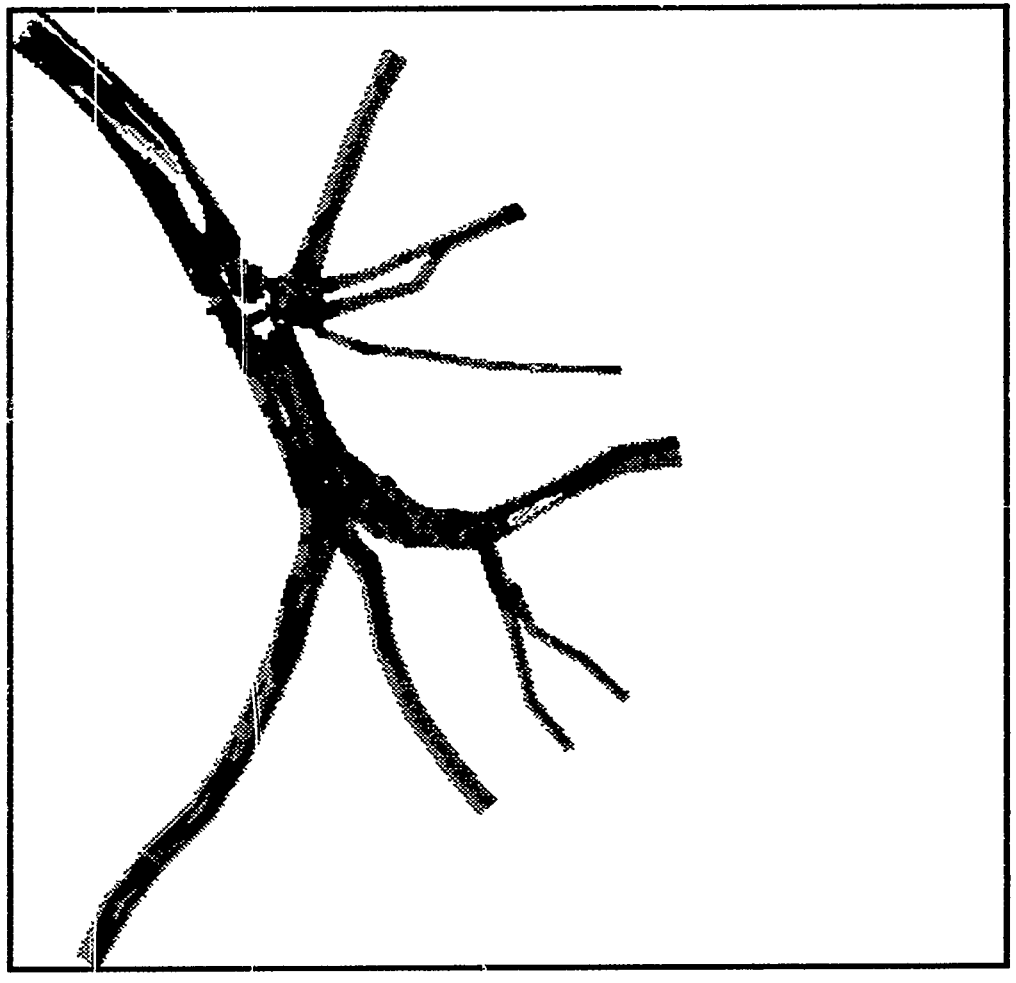
SEDIMENT CONCENTRATION
SEDIMENT TRAP
7 FEBRUARY-28 MARCH 1989

PLATE B10



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BED CHANGE
SEDIMENT TRAP
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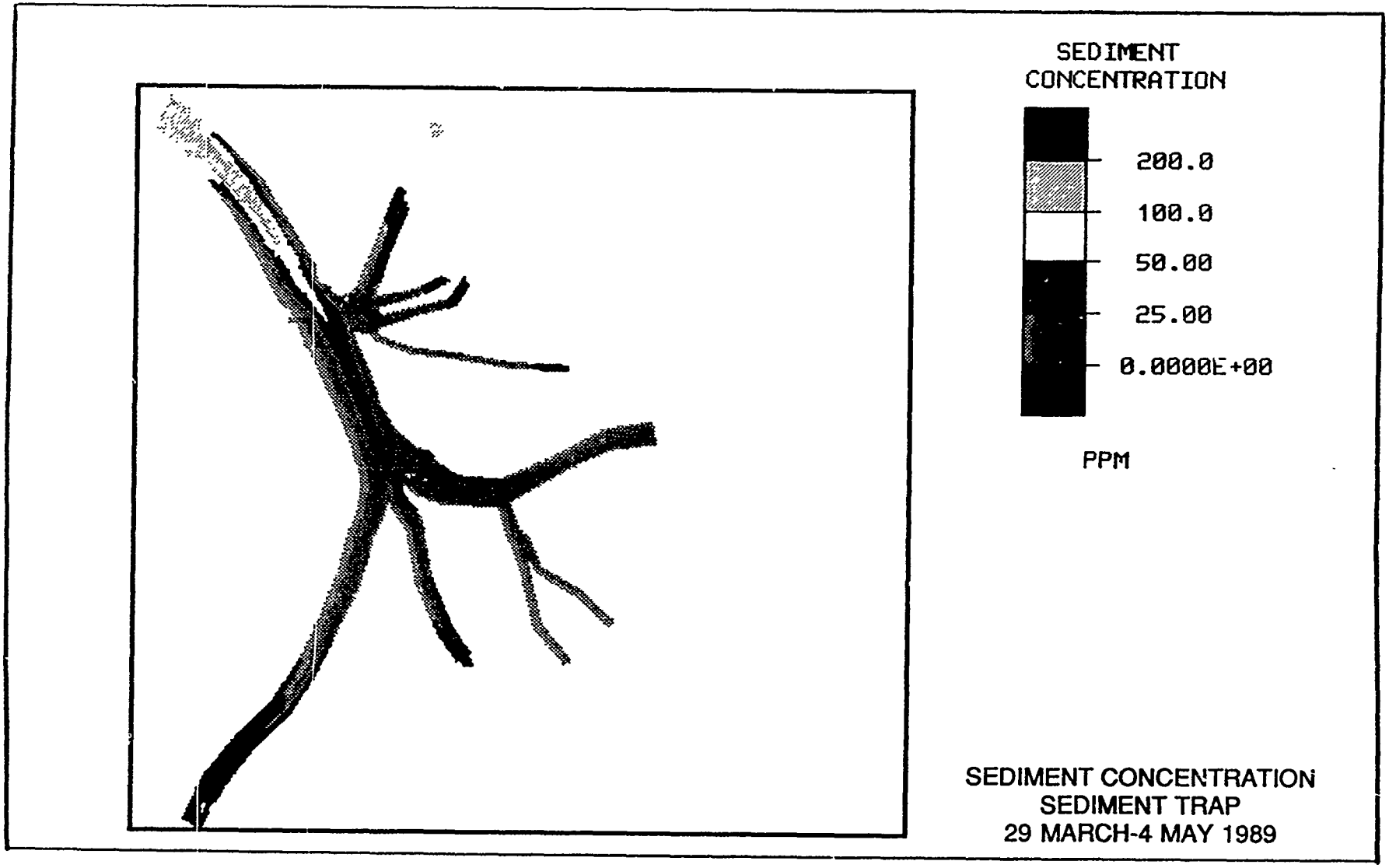
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SEDIMENT CONCENTRATION
SEDIMENT TRAP
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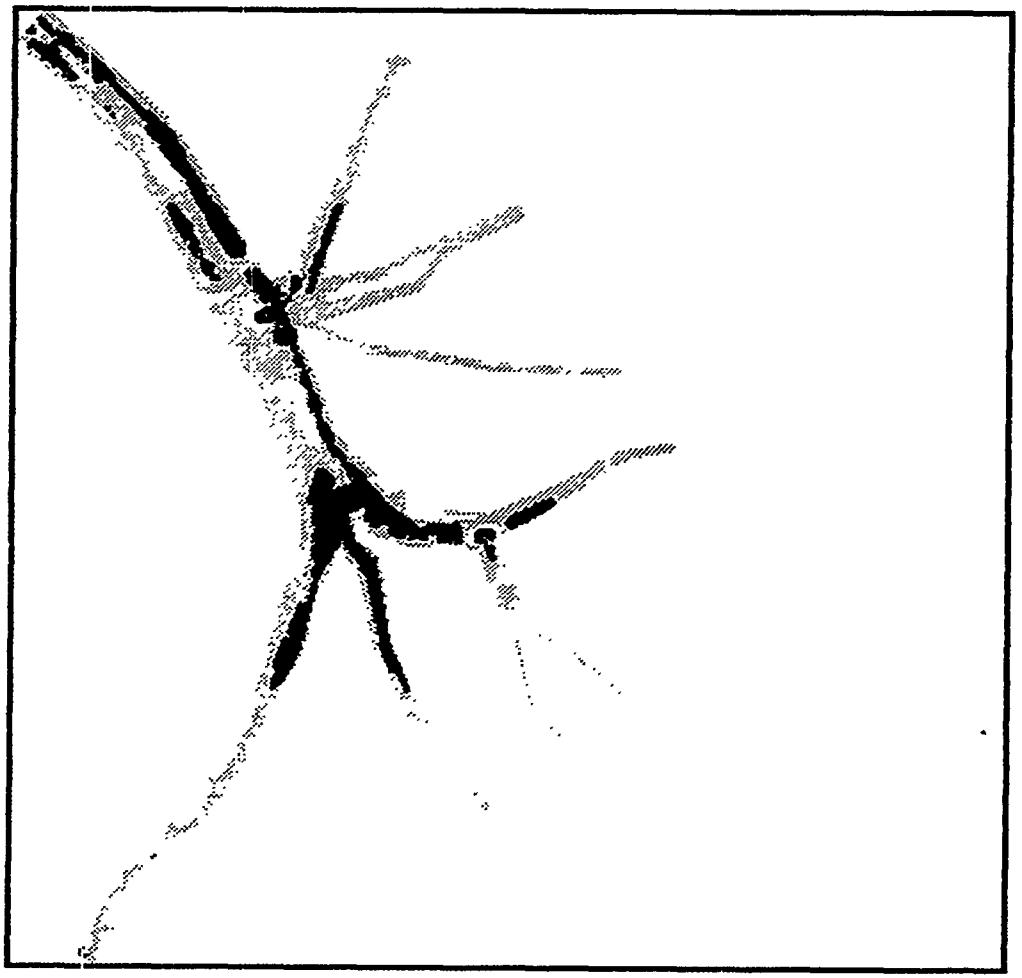
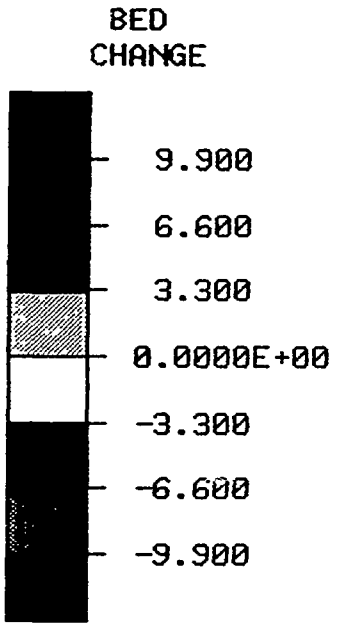
PLATE B12





BED CHANGE
DIKE PLAN 1
7 FEBRUARY-28 MARCH 1989

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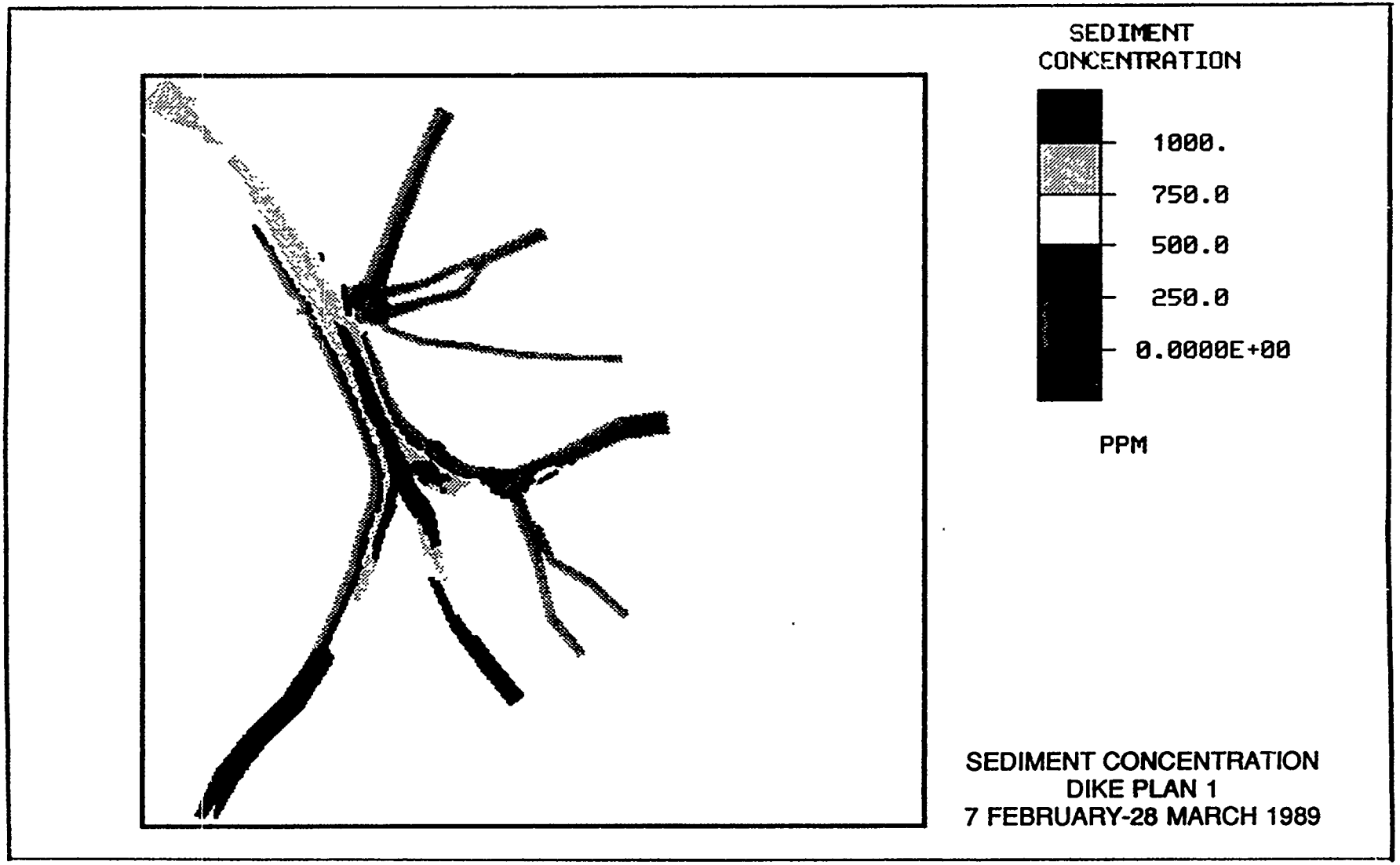

SEDIMENT CONCENTRATION
DIKE PLAN 1
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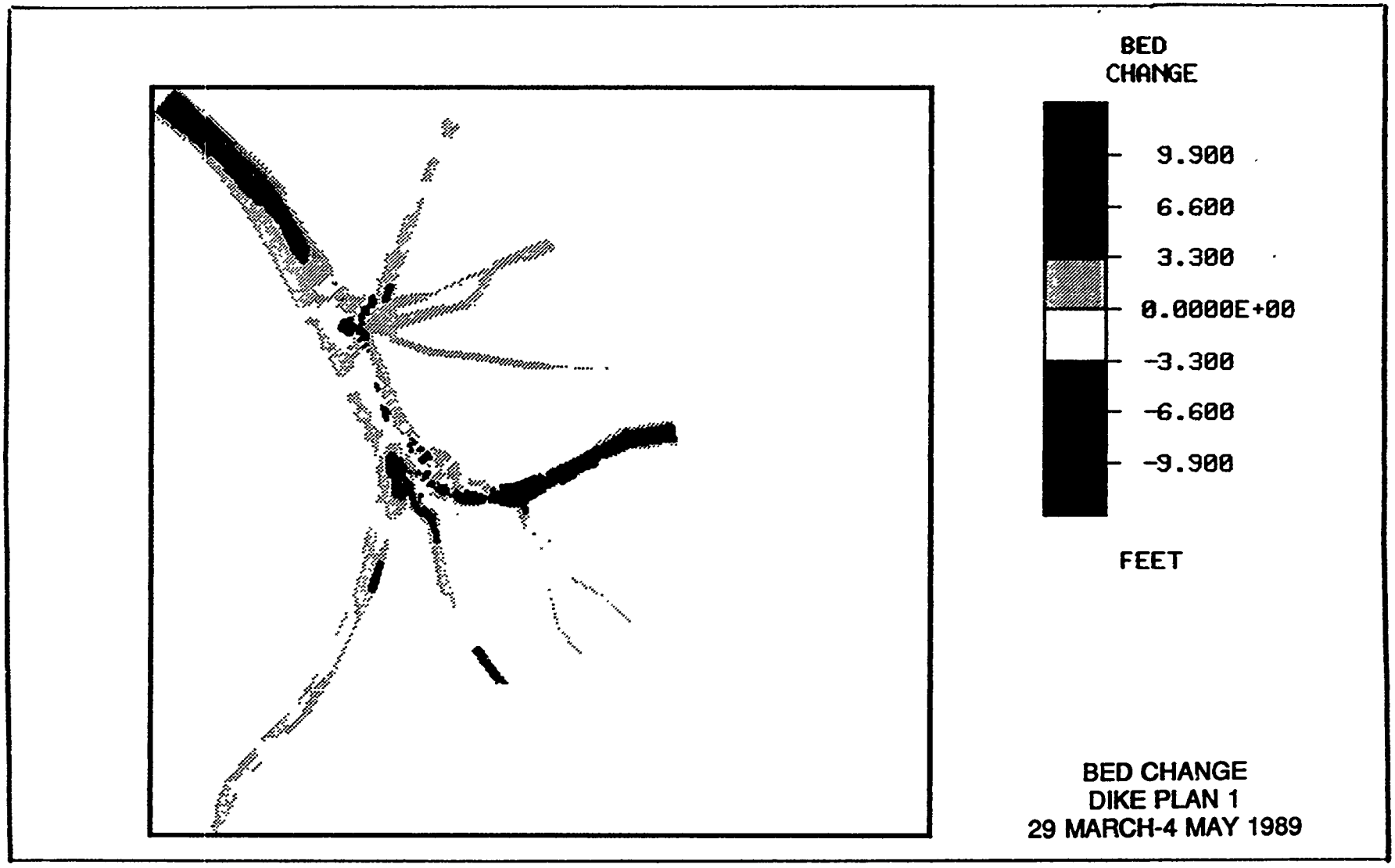
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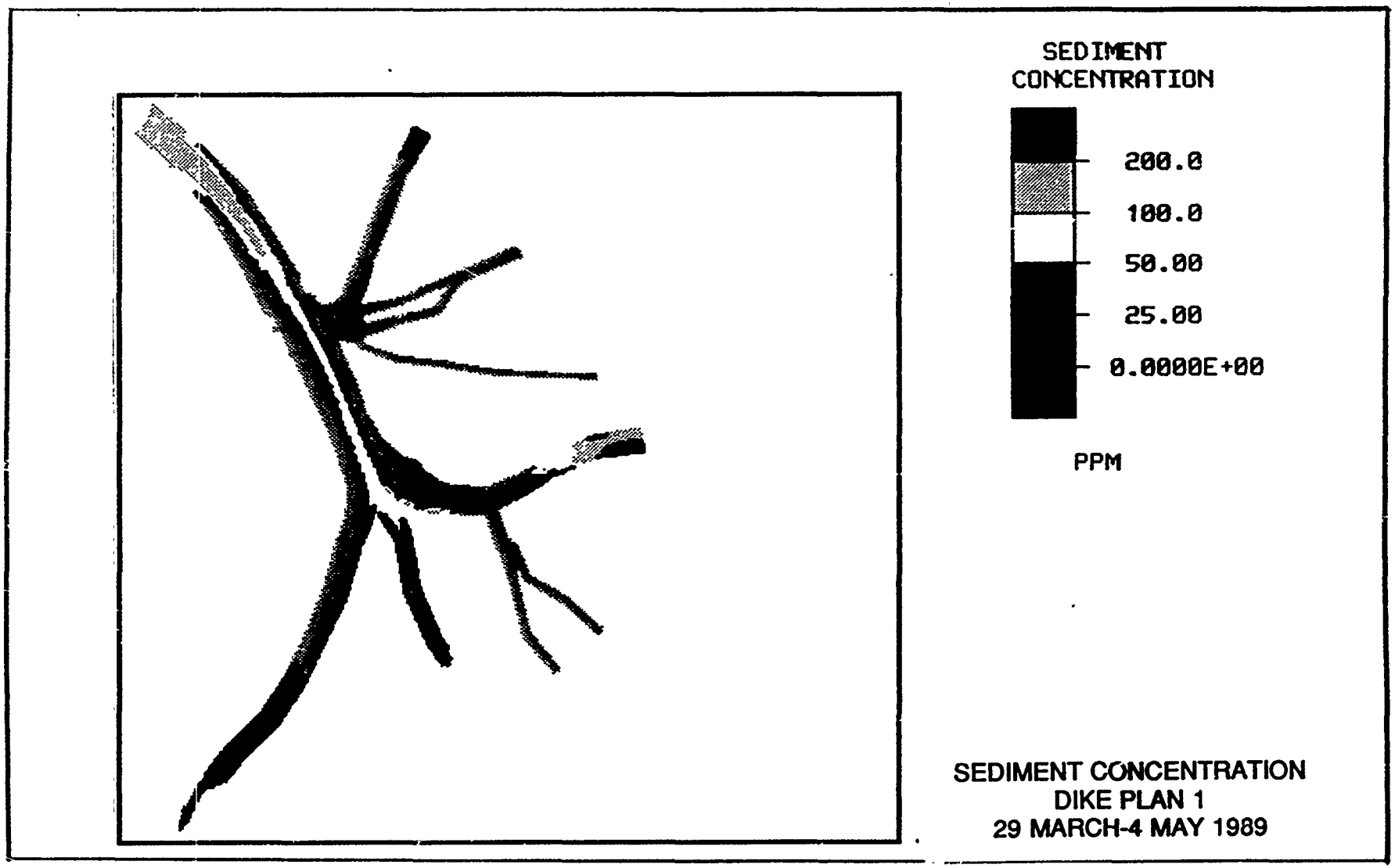
DIKE PLAN 1
29 MARCH-4 MAY 1989

PLATE B15



SEDIMENT CONCENTRATION
DIKE PLAN 1
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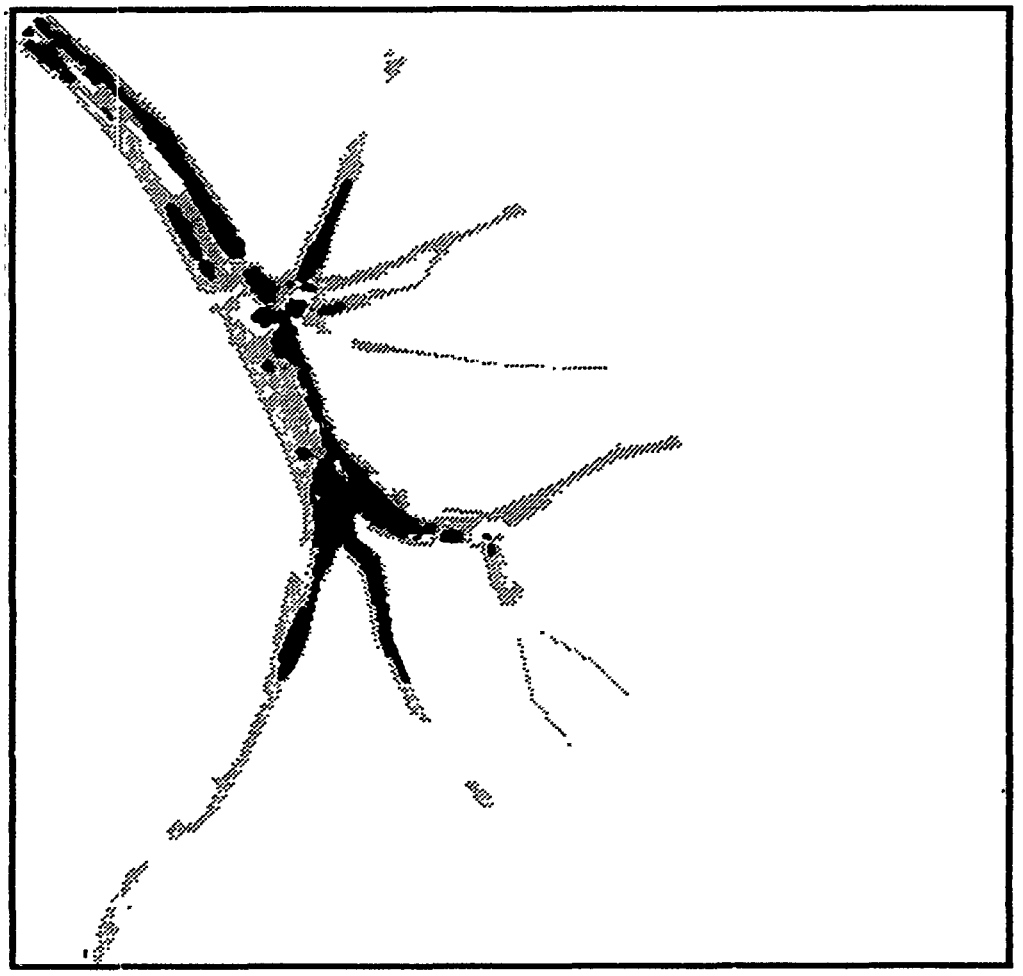
PLATE B16



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DIKE PLAN 2
7 FEBRUARY-28 MARCH 1989

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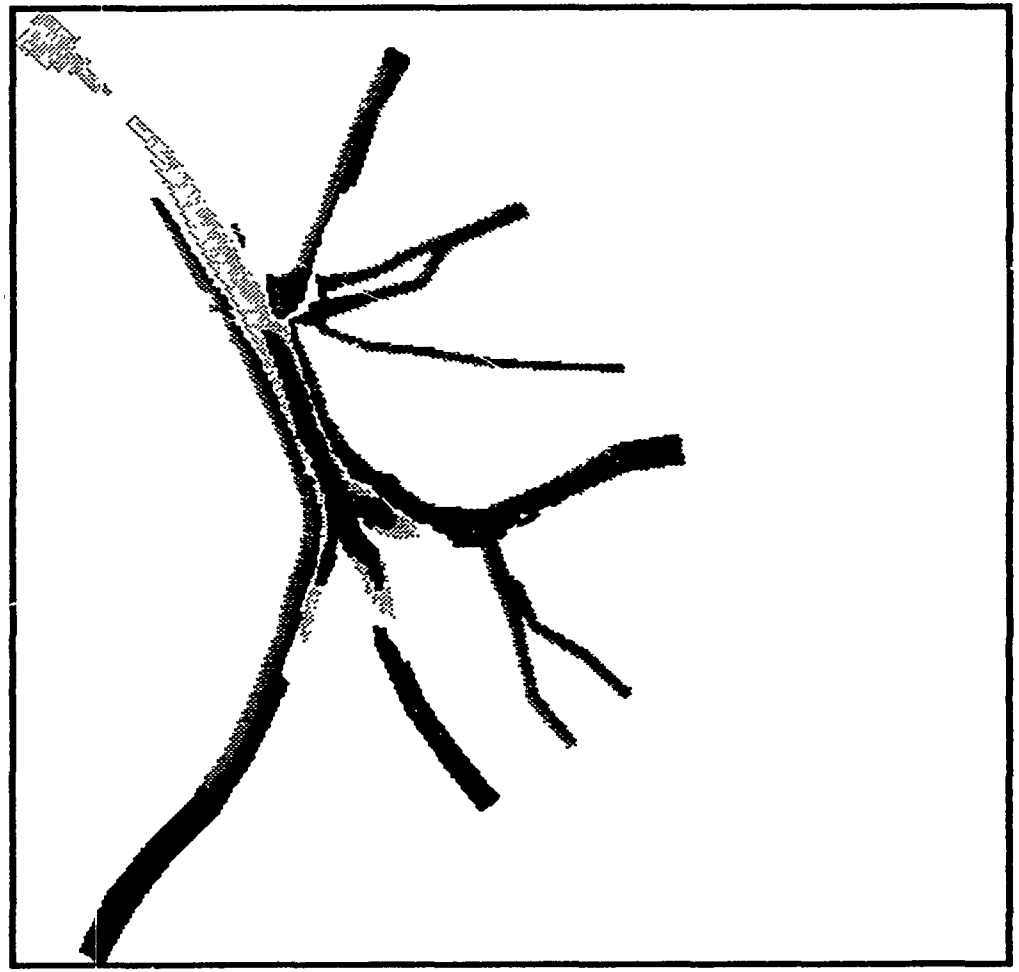

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SEDIMENT CONCENTRATION
DIKE PLAN 2
7 FEBRUARY-28 MARCH 1989

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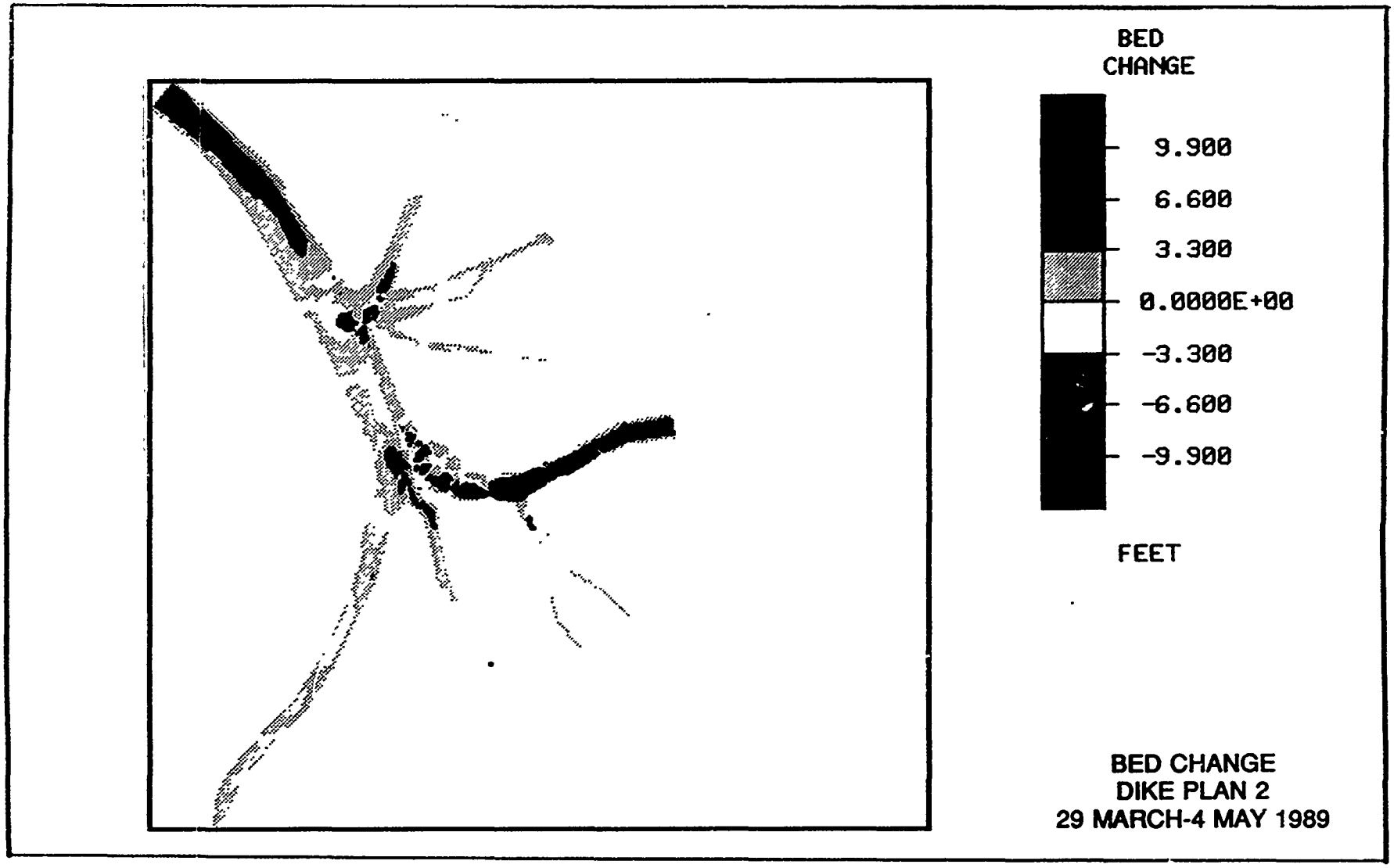
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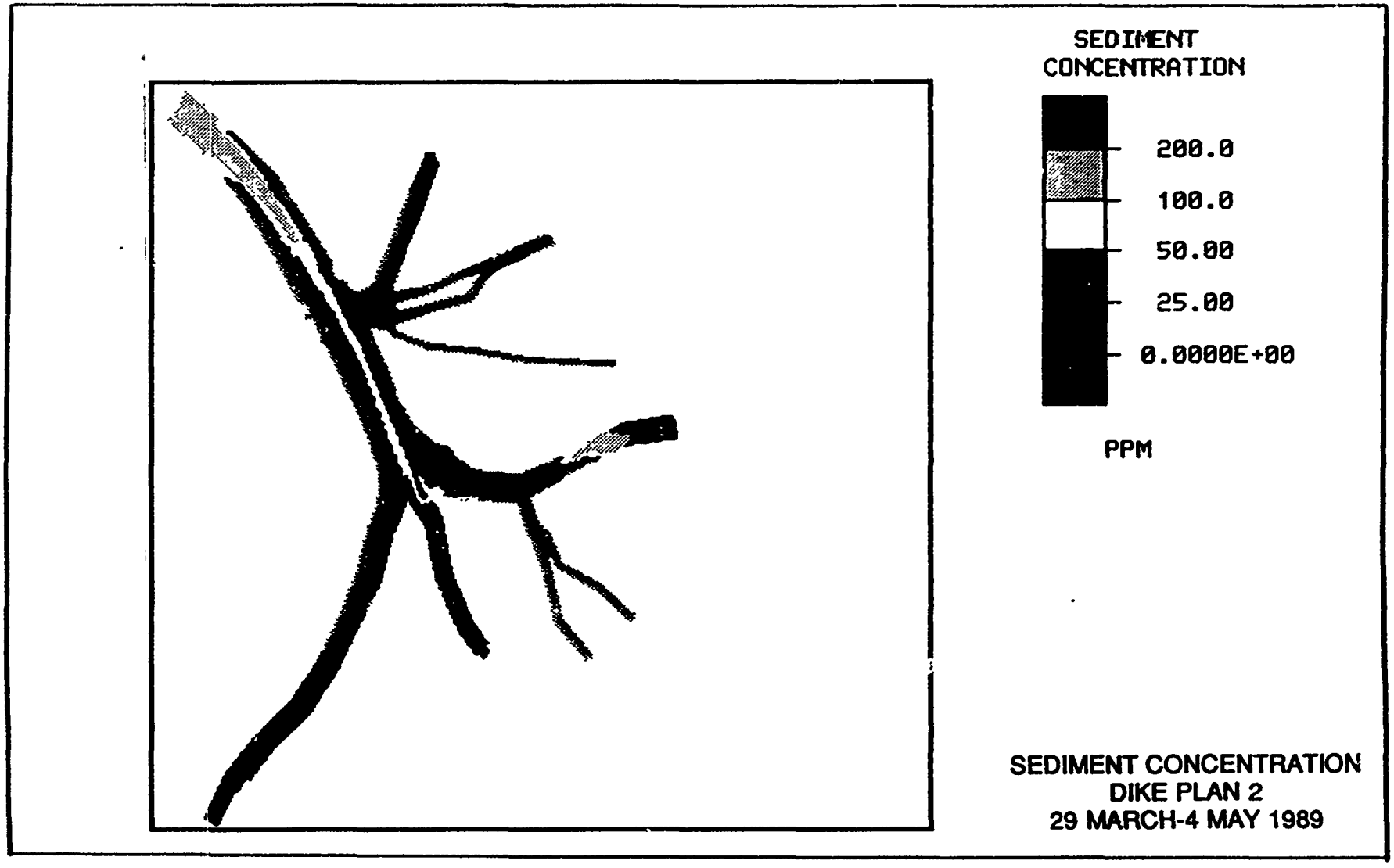

SEDIMENT CONCENTRATION
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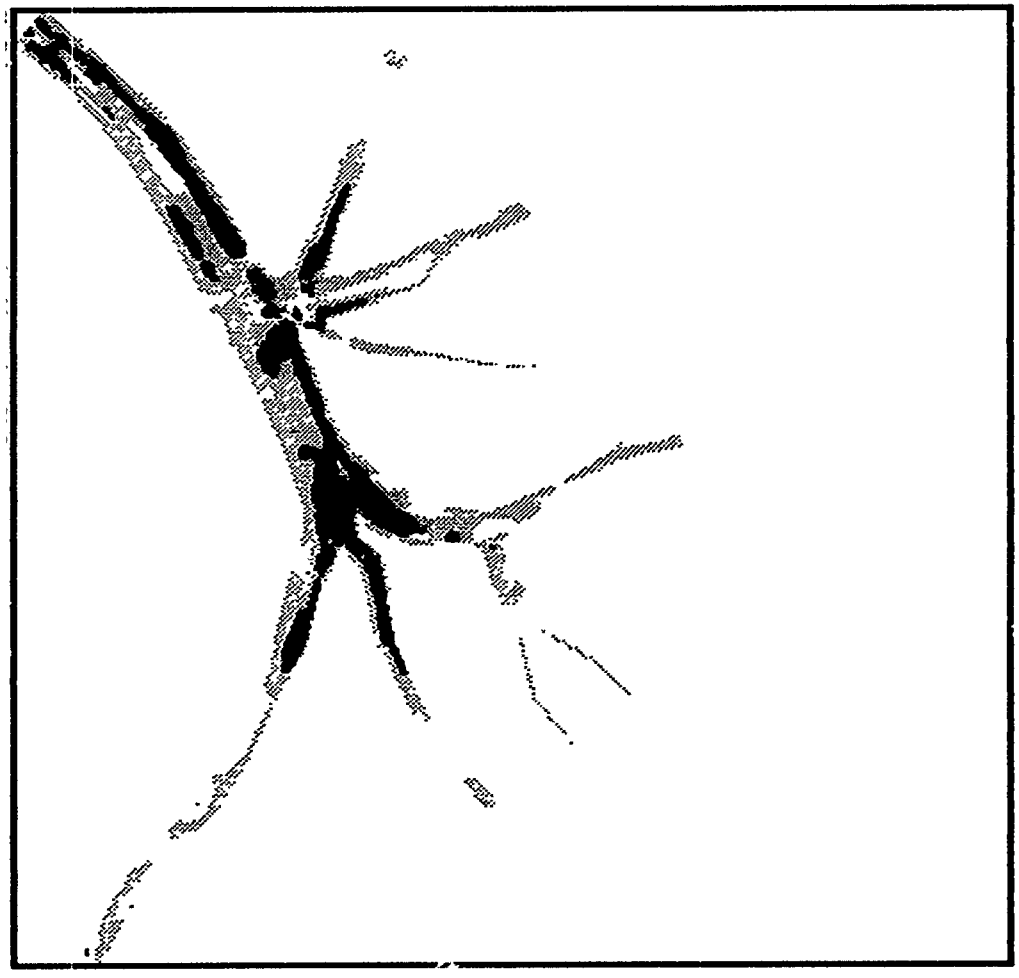
PLATE B20



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DIKE PLAN 3
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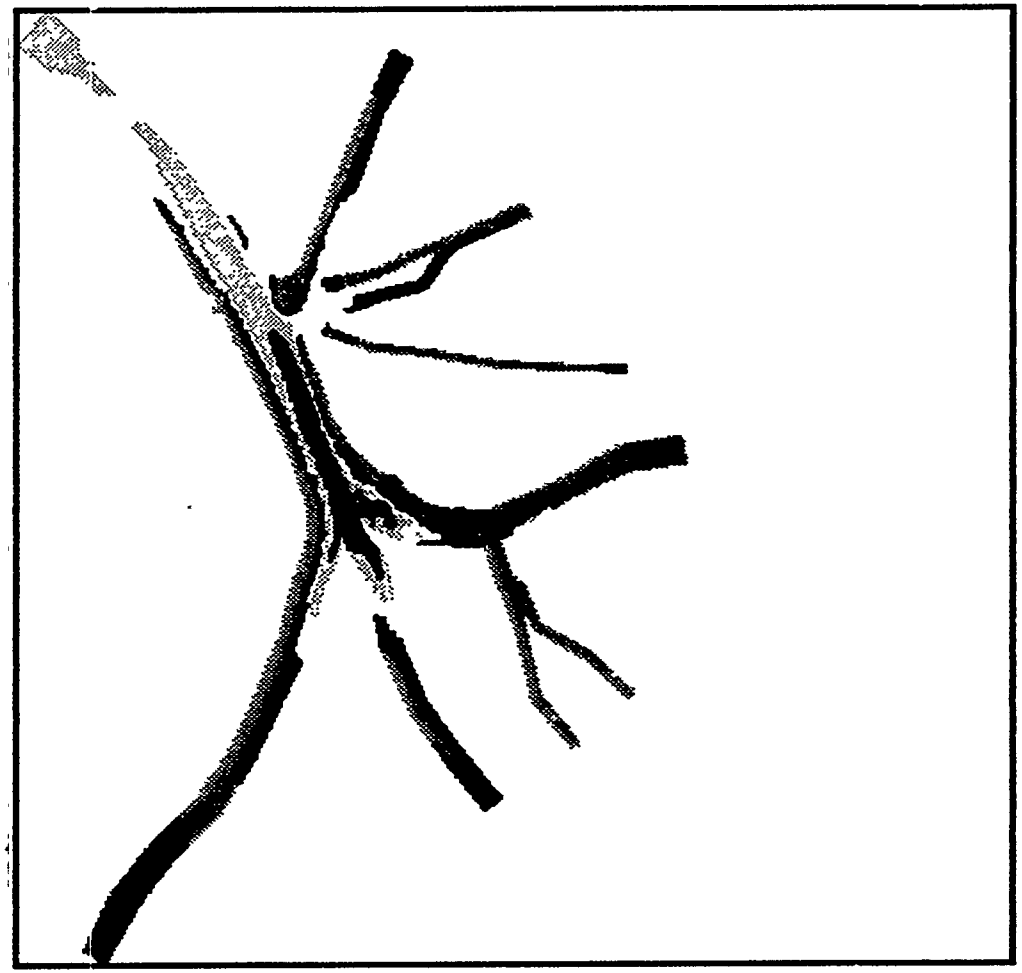

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SEDIMENT CONCENTRATION
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7 FEBRUARY-28 MARCH 1989

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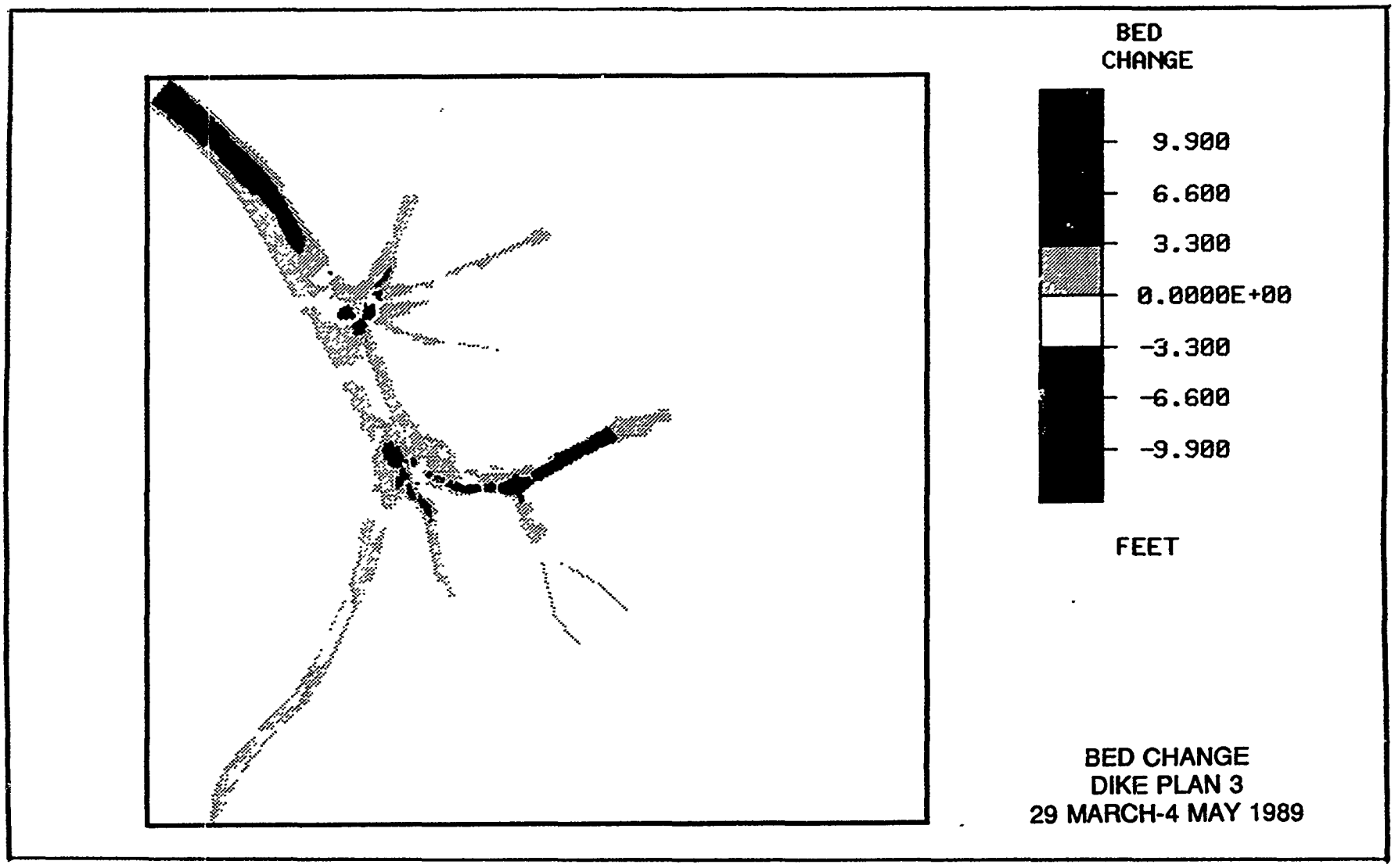
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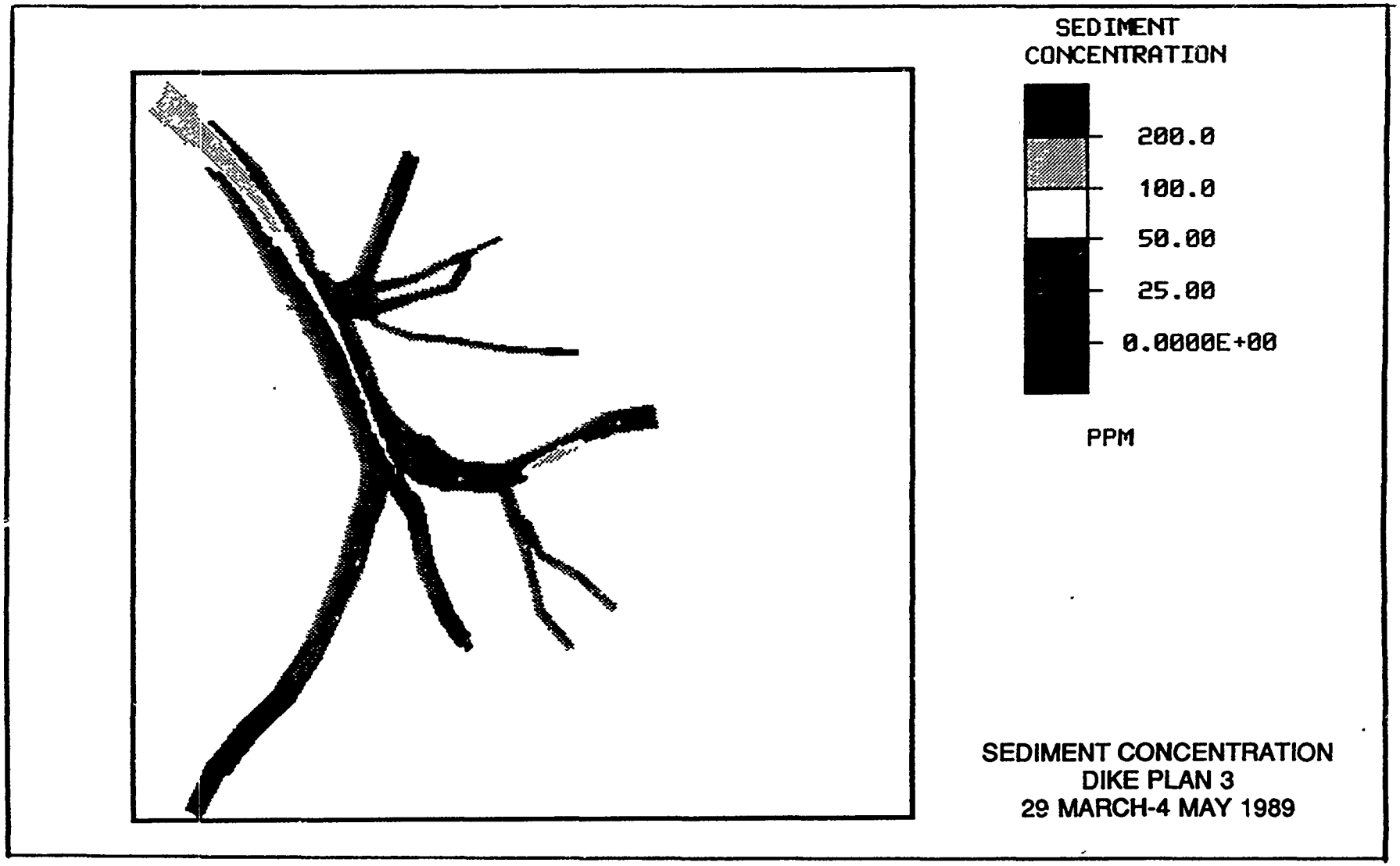
DIKE PLAN 3
29 MARCH-4 MAY 1989

PLATE B23



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29 MARCH-4 MAY 1989

PLATE B24